

## A REVISED CHRONOLOGY FOR INTIRTEKWERLE (JAMES RANGE EAST) ROCKSHELTER, CENTRAL AUSTRALIA

M.A. SMITH

*Northern Territory Museum of Arts and Sciences,  
GPO Box 2109, Alice Springs, NT 5750, Australia.*

### ABSTRACT

A revision to the chronology of Intirtekwerle (James Range East) rockshelter is proposed. A review of the depositional history is supported with fresh radiocarbon dates and it is concluded that major occupation at the site post-dates 1000 yrs BP.

**KEYWORDS:** Intirtekwerle, James Range East rockshelter, arid zone prehistory, Central Australia.

### INTRODUCTION

The purpose of this paper is to propose a revision to the chronology of Intirtekwerle rockshelter in Central Australia. This is a prerequisite for integrating the results of the 1973-4 excavations by R. A. Gould (1978) with the sequence of late holocene changes in landuse suggested by other archaeological work in the region (Smith 1986, 1983; Napton and Greathouse 1985; Stockton 1971). Using Gould's chronology the major period of occupation at Intirtekwerle begins at about 5000 yrs BP and artefacts in the underlying levels date back to about 10,000 yrs BP. Thus the sequence is seen to be one of the longest from the Central Australian ranges and directly comparable to that of Puntutjarpa (Saggers 1982; Gould and Saggers 1985). However further excavation at Intirtekwerle in 1983 and 1985 shows that major occupation at the site began much later, at around 850 years BP, and that the underlying layers need not be older than 5000 years BP.

### NOMENCLATURE

Intirtekwerle rockshelter, formerly known as the James Range East site, is situated in the James Range approximately 100 km southeast of Alice Springs. A rockhole near the shelter is called Intirtekwerle by Arrernte-speaking Aborigines (cf. Intitigula, Strehlow 1971: xxxvii, 765; Intitjikula, Gould 1978:94) and the shelter itself is referred to as Intirtekwerle intiye (Intirtekwerle cave). As this name clearly has precedence I propose that future references to the site should be in the form - Intirtekwerle (James Range East) rockshelter. This nomenclature will minimise confusion in the

archaeological literature while making the search for associated ethnographic information easier. My spelling follows the standard orthography now used for Arrernte (Aranda).

### STRATIGRAPHY

The deposits at Intirtekwerle are part of the sand sheet which forms the floor of the valley in front of the shelter (Fig. 1). Occupation debris extends out from the shelter on the surface of this sand sheet for 20-30 metres. The stratigraphy of the site reflects both the accumulation of the sand sheet and weathering and progressive collapse and retreat of the shelter.

#### Deposits outside the dripline

The deposits outside of the present dripline consist of a fine red aeolian sand containing varying amounts of occupational debris, sandstone rubble and rockfall. Unit I (see Fig. 2) contains a large amount of finely divided charcoal giving the deposit a dark grey or black colour. This unit also contains the bulk of the occupational debris such as burnt bone, chipped stone artefacts and grindstones (Fig. 3). A comparison of unit I with the underlying layers shows that it contains approximately ten times the density of chipped stone artefacts (Table 1) suggesting that significantly more intensive use of the site occurred at this time. This layer grades into the uniform red sand which comprises unit II. The latter contains little charcoal and very few artefacts (Fig. 3). Unit III is a layer of sandstone rubble in a matrix of red sand (Fig. 3). Figure 2 shows that on the slope outside the dripline the rubble interdigitates with aeolian sand (see c in Fig. 2). Chipped stone

artefacts are present throughout unit III in small numbers but there is a minor peak near the top of the unit (Fig. 3).

### Deposits in the shelter

Gould (1978:98) notes that the deposits within the shelter are slightly different in texture and colour to those outside the dripline. This is presumably due to a greater proportion of fine white sand derived from weathering of the shelter walls (Mereenick sandstone). Thus the sediments at the eastern end of trench I are observed to be redder in colour and slightly coarser in texture than those at the western end. Within the shelter unit I is also noted to contain more fine ash and charcoal.

### Unit III rubble

The rubble in unit III consists of poorly sorted sub-angular pieces of sandstone (the term rubble is used for rocks 5-50 mm in size, which loosely approximates the Wentworth size class for pebbles). Larger rocks up to 100 mm are common but the modal size for rocks is about 30-40 mm (excluding large boulders).

The rubble is distributed within a matrix of red sand which is identical in colour and texture to that forming unit II (see Fig. 4). Particle-size analysis of the matrix shows that both unit II and III are made up of predominantly fine to very fine sand (approximately 80% wt.) with a small silt/clay fraction (approximately 10% wt.).

Both the composition of unit III and the presence of artefacts throughout the layer suggests that it was not formed by a single large rockfall or debris flow. Gould interpreted it as a layer of rockfall that had progressively accumulated over some time (1978:99). Slopewash is another process which could have contributed material to this unit and it is likely that some of the sediment and pebbles derive from the small cone of debris at the foot of the scarp on the north side of the shelter.

Despite the obvious change in the proportion of rubble and sand from unit III to unit II the sequence appears to be essentially a continuous record of deposition. There is little to suggest a disconformity between these units. Figure 4 shows the boundary between the units. There is no evidence of erosion, reworking or sorting of the sediment nor of

epimorphic processes such as weathering, leaching, or induration. However without local information about the rate of such processes I cannot entirely dismiss the possibility that there is a period of elapsed time between the accumulation of the two units.

## PROBLEMS WITH THE CHRONOLOGY

Gould presented seven radiocarbon dates to support his chronological framework (Table 2). The main problems with it are that the dates from different trenches do not agree on the age of unit I, the key date (I-7599) for the framework diverges markedly from the age/depth relationship of the other dates and there are no dates from units II and III.

### The existing framework

Gould accepted the oldest of his dates as reliable and inferred that the basal age of unit I was approximately 5,000 years B.P. Extrapolating from this he suggested that the basal levels of the site may date to 10,000 years BP (Gould 1978:105, 1979:32). Thus the assemblage of stone artefacts was divided into two phases: *James Range II* from unit I dating back to 5,000 years BP and *James Range I* from the underlying sediments, of possible pleistocene age. Changes in the assemblage from phase I to phase II appeared to corroborate this scheme. For instance backed blades first appear in levels dated to about 5,000 years BP. This is in line with the age of similar technological changes in southern and eastern Australia.

### Problems

**Age of unit I.** The uncertainty over the age of unit I is evident in Table 2. To accommodate these divergent dates one could argue that the rate at which the deposit accumulated varied markedly in different parts of the site. For instance, on the flat in front of the shelter the unit would appear to have accumulated between 1800-1500 years BP. In the shelter it accumulated at about 4600 years BP and then from 700 years BP onward. However, this interpretation is not consistent either with Gould's description of the stratigraphic relationships across the site nor with his section drawings which show unit I as a continuous layer. Furthermore Gould attributes his dates of 715 $\pm$ 80 and 4640 $\pm$ 260

to the same subunit of unit I which implies that he saw no evidence of any break in the depositional sequence at this point. My own field observations suggest that the sandsheet in the area has built up at a steady, though not necessarily constant, rate and that it is unlikely that unit I could vary so much in its age across a distance of only 5-10 m.

**Reliability of I-7599.** A prima-facie case can be made that the key date of  $4640 \pm 260$  (I-7599) does not accurately reflect the age of unit I. Figure 5 shows the extent to which it diverges from the age/depth relationship of

**Table 1.** Comparative density of chipped stone artefacts.

<b>1974 trench 1.</b>			
<i>Unit</i>	<i>Volume</i>	<i>No. artefacts</i>	<i>Density</i>
I	7.2 m <sup>3</sup>	17,742	2464/m <sup>3</sup>
II/III	15.7 m <sup>3</sup>	3,219	205/m <sup>3</sup>
Total	22.9 m <sup>3</sup>	20,961	915/m <sup>3</sup>
<b>1983/5 square L11</b>			
I	0.9 m <sup>3</sup>	1,449	1610/m <sup>3</sup>
II/III	1.7 m <sup>3</sup>	194	114/m <sup>3</sup>
Total	2.6 m <sup>3</sup>	1,643	632/m <sup>3</sup>

**Table 2.** Radiocarbon dates. Depths (cm) are below ground surface.

<b>Unit I</b>				
Trench 1.	I-7600	195 $\pm$ 80	8 cm	hearth
	I-8308	285 $\pm$ 80	42 cm	hearth
	I-8306	715 $\pm$ 80	50 cm	hearth
	I-7599	4640 $\pm$ 260	70 cm	dispersed charcoal
Trench 2.	I-8307	1840 $\pm$ 105	57 cm	dispersed charcoal
Trench 3.	I-8643	1525 $\pm$ 80	17 cm	hearth
1983.	SUA2247	670 $\pm$ 100	34-40 cm	dispersed charcoal
<b>Unit II</b>				
1983.	SUA2125	1460 $\pm$ 210	120-160 cm	dispersed charcoal
<b>Uncertain context</b>				
Trench 2.	I-7601	2495 $\pm$ 85		dispersed charcoal from feature interpreted as a pit



**Fig. 1.** The sandplain at Intirtekwele. The position of the rockshelter is shown by the arrows. The staff held by the person is 4 m long.



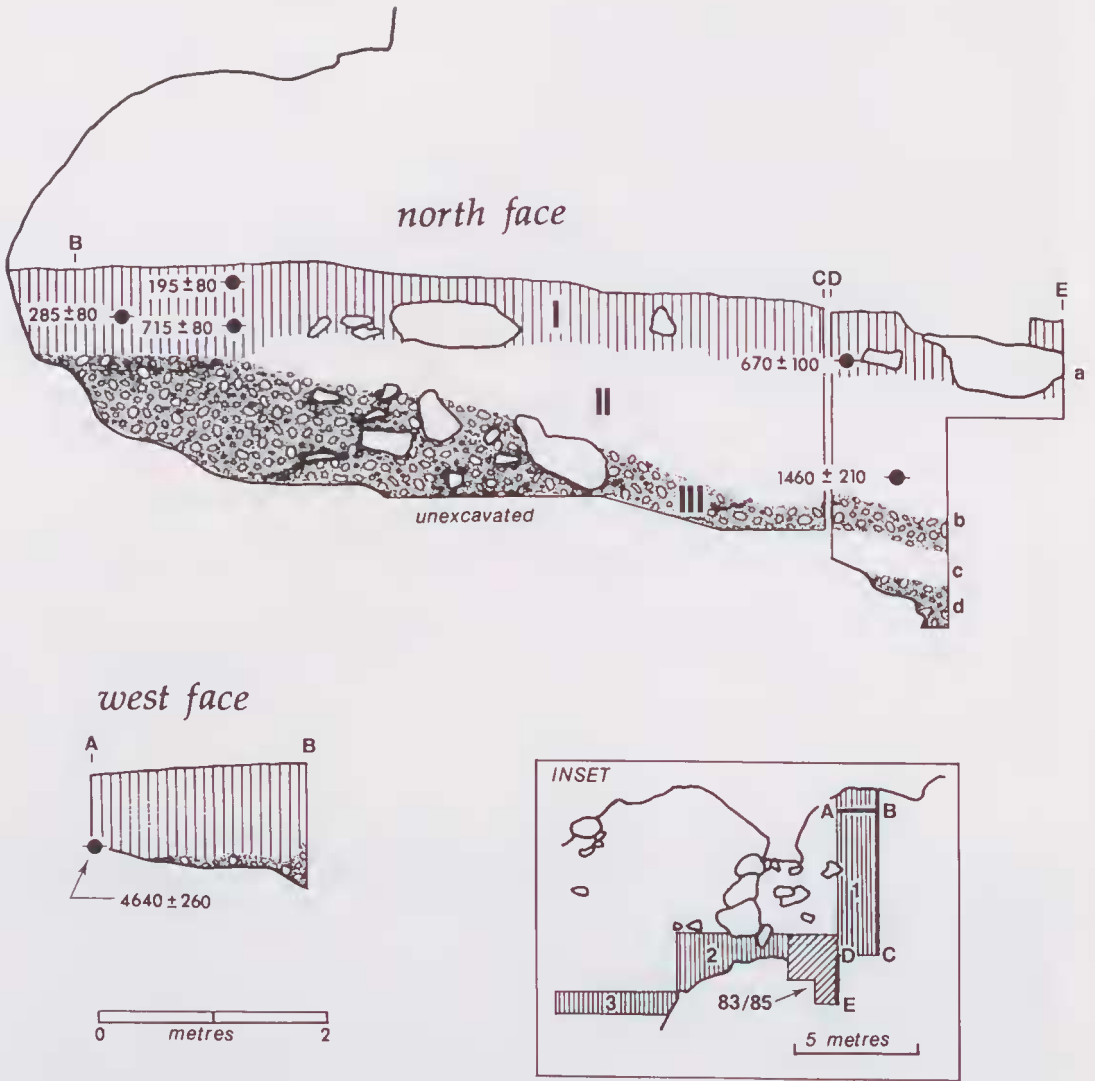


Fig. 2. Stratigraphic section. Redrawn from Gould (1978) with additions from 1983/85 excavations at right. The lower case letters in the right margin key the section into Figure 3.

the other dates for trench 1. Of Gould's four dates from adjacent squares in this trench, three form a consistent sequence back to  $715 \pm 80$  years BP and date charcoal from features interpreted as hearths. There is only 20 cm difference in level between this date and the fourth date, that of  $4640 \pm 260$ . As both are attributed to the same part of unit I by the excavator I suggest that I-7599 is anomalous.

**Provenance of I-7599.** The provenance of I-7599 is open to question because the sam-

ple has come from a stratigraphically complex part of the site which has been disturbed by burrowing animals. The sample consisted of scattered charcoal pieces collected from the south face of trench 1 just above bedrock. Gould's section (1978, Fig. 5) shows that this part of the site has been disturbed by burrowing animals and an independent study by Webster (1982) confirmed that the deposits within the shelter are extensively disturbed by *Bettongia lesueur*, a small macropod. It is possible therefore that I-7599 could be either

charcoal dislodged from unit III (which directly underlies unit I in the northern part of the shelter) or charcoal from a pocket on the shelter floor possibly predating unit III.

**Changes in the assemblage.** The changes in the type of stone artefacts between unit I and units II/III cannot be used to corroborate the present chronological framework. Firstly, the age of small-tool tradition assemblages in Central Australia and surrounding regions is not well established (see Johnson 1979:133). Secondly, the first appearance of artefacts such as backed blades, adzes and seedgrinders may be masked by the sampling problems that accompany changes in the intensity of site use and assemblage size. For instance, although a backed blade was associated with a date of  $3210 \pm 90$  years BP at Ilarari kulpi (Smith 1983:31-2), the first appearance of assemblages containing these artefacts at the three Kuyunpe sites (Smith 1983; Napton and Greathouse 1985) and at Keringke (Stockton 1971; Smith 1983:38) took place at different times within the last 1000 years and in each case is associated with the main occupation at the site.

**Tula adzes in unit II.** Although the chronology of these artefacts is not known in any detail the presence of two tula adze slugs in unit II at depths of 69-76 cm and 91-99 cm respectively suggests that this layer is not older than 5000 years BP.

#### FURTHER RADIOCARBON DATES

In 1983 and 1985 I re-excavated Intirtekwele to examine the depositional history of the site. Further samples for radiocarbon dating were collected to test the hypothesis that the basal age of unit I was less than 5000 years BP.

Five square metres were excavated at the eastern end of trench I (Fig. 2 inset) where I expected that the deposit would be less disturbed than that in the shelter. The deposit was excavated using 5-10 cm spits and sieved using 3 mm and 6 mm mesh. The sieve residues were retained and later wet sieved. Charcoal was recovered by flotation.

Unit III was found to contain very little charcoal and the amount recovered was too small to directly date this unit. From a cubic metre of deposit only 1.2 g of charcoal was recovered by flotation.

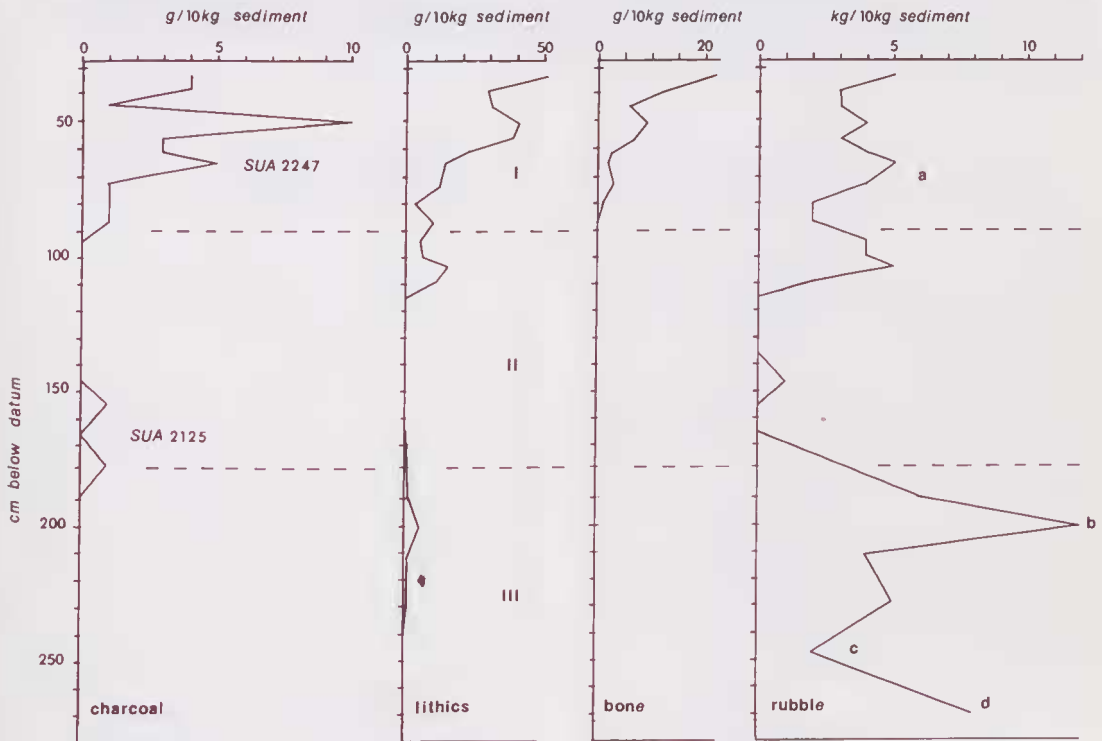


Fig. 3. The distribution of charcoal, chipped stone artefacts, bone and rubble (rocks from 5-50 mm) in square L11 (1983/85). Lower case letters key the graphs into Figure 2. Depths are cm below site datum.



Fig. 4. North face of square L11 (1983/85). The interface of unit II and III is shown by the arrow. The fill of Gould's trench is visible on the left.

From the base of unit II a date of  $1460 \pm 210$  BP (SUA2125) was obtained on finely divided charcoal. Care was taken to ensure that the sample was not contaminated by recent material. The sandy matrix in this part of the site was uniform and there was no sign of root penetration, burrows or insect casts. Figure 3 shows the minor peak in charcoal at the base of this unit.

A second sample, of scattered charcoal pieces, was submitted from the lower part of unit I as a cross-check on SUA2125. This sample gave a date of  $670 \pm 100$  BP (SUA2247).

These dates appear to be internally consistent and except for I-7599 they agree well with the dates obtained for trench 1. Together the five dates now form a consistent chronological sequence for the site.

#### REVISED CHRONOLOGY

The balance of the evidence suggests that the date of  $4640 \pm 260$  years BP (I-7599) does not accurately reflect the age of unit I.

Since this date is the cornerstone of the present chronology it follows that significant revisions are warranted.

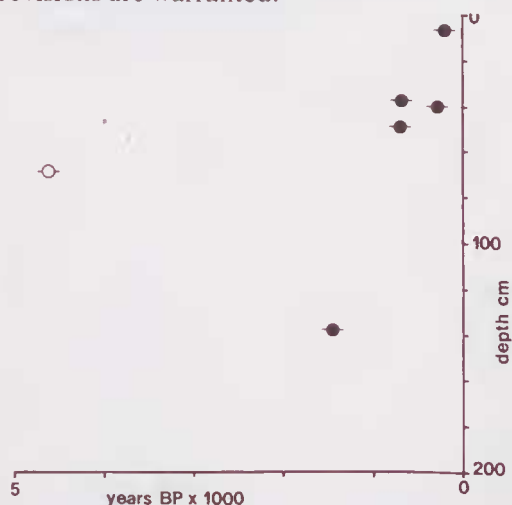


Fig. 5. Age/Depth graph for radiocarbon dates from trench 1 and the 1983/85 excavations. Depths are in cm below ground surface. I-7599 is shown by the open symbol at the far left.

A sequence of five dates, from trench 1 and the 1983/85 excavations show that the basal age of unit I is about 850 years BP (interpolated date) and of unit II about 1500 years BP.

The date of  $1460 \pm 210$  forms a *terminus ante quem* for unit III. As I see no evidence to suggest a major disconformity here I suggest that the top of unit III dates to about 1500-2000 years BP. This is in line with Gould's date of  $2495 \pm 85$  (I-7601) obtained from a deep pit or burrow which from its depth (2.13 m) must have penetrated well into unit III. If the rapid rate of deposition evident in unit II is extrapolated this would give a basal age of approximately 3000-3500 years BP for unit III. However if the rate of accumulation of unit III was slower, as seems likely, this figure would represent a minimum basal age for the unit. If one accepts my interpretation of the provenance of I-7599 then the maximum age of the unit need not be greater than about 5000 years BP. Without direct radiocarbon dating it is difficult to further refine these estimates.

If Intirtekwerle is considered in its regional context the above revisions to the chronology remove an anomaly. For instance, other sites bordering the sandplains such as Ilarari kulpi, Kuyunpe and Keringke show rapid rates of deposition of the order of 50-60 mm/100yr (Smith 1983). It seems unlikely that the much lower rates implied by Gould's chronology would have prevailed on the sandsheet at Intirtekwerle.

Similar changes in site use also occurred at other prehistoric sites across Central Australia. In each case an ephemeral use of the site is followed by more intensive occupation represented by a dark grey layer with burnt bone and a high density of chipped stone artefacts and grindstones. Table 3 lists radiocarbon dates for the lower part of this late holocene occupation horizon at various sites. The nature, timing and possible causes of the change are currently being investigated by the author and are beyond the scope of this paper. However it is worth noting that major late holocene occupation begins in Central Australia after 1000 years BP and that the revised chronology brings the changes at Intirtekwerle into line with the regional sequence.

**Table 3.** Radiocarbon dates for the lower part of the late holocene occupation horizon at sites in Central Australia.

Site	Type	Radiocarbon age	
Rainbow Valley 1	opensite	$980 \pm 80$	Beta-16306
Wanmara	opensite	$970 \pm 70$	Beta-16307
Tjungkupu 2	opensite	$940 \pm 70$	Beta-16305
Keringke	opensite	$920 \pm 130$	ANU-426
Tjungkupu 1	rockshelter	$840 \pm 80$	Beta-16303
Intirtekwerle	rockshelter	$670 \pm 100$	SUA-2247
Kuyunpe 6	rockshelter	$590 \pm 80$	SUA-2096
Therretrete	open site	$400 \pm 50$	SUA-2520
Kuyunpe 1	rockshelter	$265 \pm 75$	Beta-4895

## ACKNOWLEDGEMENTS

I wish to thank Mr and Mrs W. Hayes of Deep Well Station for their cooperation in this research, E. Chaloupka, B.J. Cundy, J. Kaye, K.T. Roth and S. Sutton who assisted with the 1983 and 1985 excavations, Edward and Gregory Johnson, George Breaden, and Alan Drover who gave their consent for the work at Intirtekwerle, and the late A. Blackwell who assisted with the processing of the excavated material. I also wish to acknowledge the assistance of R. A. Gould who made available plans and section drawings of his 1973/74 excavations at Intirtekwerle and who commented at length upon several drafts of this paper. SUA2125 was funded by the Northern Territory Museum and SUA2247 by a Northern Territory University Planning Authority research award.

## REFERENCES

- Gould, R. A. 1978 James Range East Rockshelter, Northern Territory, Australia: A summary of the 1973 and 1974 Investigations. *Asian Perspectives* **21** (1): 85-126.
- 1979 Exotic stones and Battered bones: Ethnoarchaeology in the Australian Desert. *Archaeology* **32** (2): 28-37.
- Gould, R.A. and Sagers, S. 1985 Lithic procurement in Central Australia: a closer look at Binford's idea of embeddedness in Archaeology. *American Antiquity* **50** (1): 117-136.
- Johnson, I. 1979 *The Getting of Data: A case study from the recent industries of Australia* Ph.D. Thesis, Australian National University: Canberra.
- Napton, L. K. and Greathouse, E. A. 1985 Archaeological investigations at Pine Gap (Kuyunha), Northern Territory. *Australian Archaeology* **20**: 90-108.
- Sagers, S. 1982 Comparative analysis of adzes from Puntutjarpa rockshelter and the James Range East site complex, Australia. *Archaeology in Oceania* **17**: 122-126.

- Smith, M. A. 1983 Central Australia: Preliminary archaeological investigations. *Australian Archaeology* **16**: 27-38.
- 1986 The antiquity of seedgrinding in arid Australia. *Archaeology in Oceania* **21**: 29-39.
- Stockton, E. D. 1971 Investigations at Santa Teresa, Central Australia. *Archaeology and Physical Anthropology in Oceania* **6**: 44-61.
- Strehlow, T. G. H. 1971 *Songs of Central Australia* Angus and Robertson: Sydney.
- Webster, J. 1982 *Faunal Analysis and the James Range East Site* B.A. Honours Thesis, University of Sydney.

Accepted 14 August 1986